

CLAIMS

What is claimed is:

1. A method to determine the molecular electrical conductivity of a compound, comprising the steps of:
  - 5 a) providing a compound which form self-assembled monolayers;
  - b) forming a self-assembled monolayer of the compound on a substrate; and
  - c) measuring the difference between the surface potential of the substrate and the surface potential of the self-assembled monolayer comprising the step of using surface scanning potential mapping.
2. The method of Claim 1 wherein the substrate is metallic.
3. The method of Claim 1 wherein the substrate is selected from the group consisting of Au, Ag, Pd, Pt, Cu, Al and Ni.
- 15 4. A method to determine the relative molecular electrical conductivities of a plurality of compounds, comprising the steps of:
  - a) providing a plurality of compounds which form self-assembled monolayers;
  - 20 b) forming a discrete area of a self-assembled monolayer for each compound of (a) on a single substrate;
  - c) measuring the surface potential of each discrete area comprising the step of using surface scanning potential mapping for each self-assembled monolayer; and
  - 25 d) comparing the measured surface potentials of (c) to determine the relative molecular electrical conductivities of the plurality of compounds.
5. The method of Claim 4 wherein the substrate is metallic.
6. The method of Claim 5 wherein the substrate is selected from the group consisting of Au, Ag, Pd, Pt, Cu, Al and Ni.